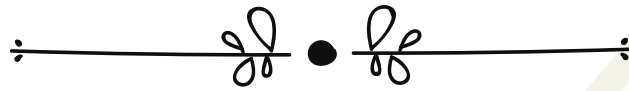


BIOHACK NOTES



REPRODUCTION IN FLOWERING PLANTS

- BASED ON ACTIVE RECALL AND SPACED REPETITION
- TARGET 360/360 IN NEET BIOLOGY & 100/100 IN BOARDS!



PARTH GOYAL

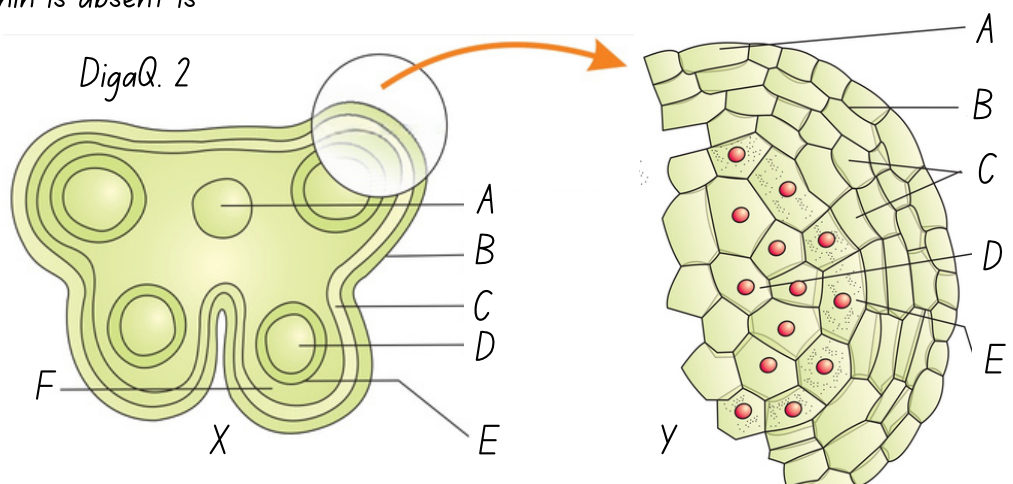
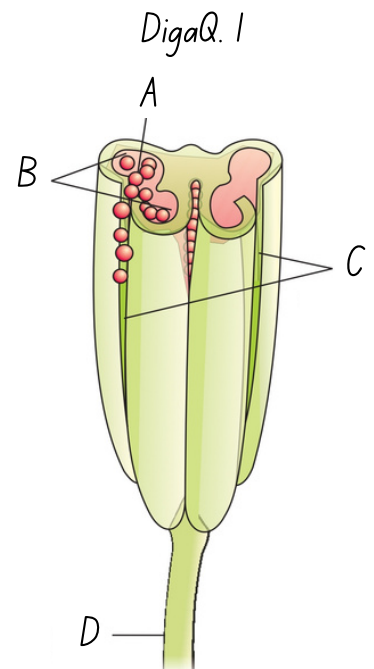




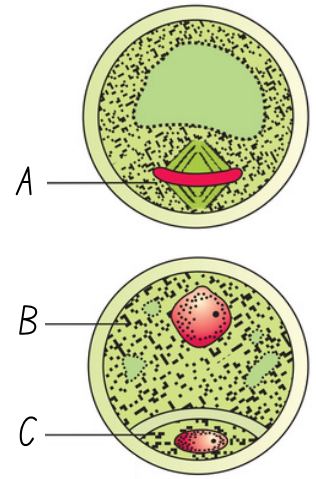
• PRE-FERTILLISATION : STRUCTURE & EVENTS

• STAMENS, MICROSPORANGIUM & POLLEN GRAIN

1. _____ are morphological and embryological marvels.
2. 2 parts of stamen are -
3. The proximal/distal end of the filament is attached to _____ or _____ of the flower. (NEET)
4. A typical angiosperm anther is unilobed/bilobed and monothealous/dithealous condition.
5. Anther consist of _____ no. of microsporangia.
6. Microsporangia develop further and become _____
7. The 4 wall layers of microsporangium are -
8. _____ nourishes the developing pollen grain.
9. The outer 3 layers perform the function of - (2)
10. Tapetum have light/dense cytoplasm and one/more than one nucleus.
11. When the anther is young, a group of compactly arranged cells called _____ occupies the centre of each microsporangium.
12. The two anther lobes are attached to each other by _____
13. _____ help in dehiscence of anther due to their hygroscopic nature.
14. Tapetum surrounds the sporogenous tissue. T/F
15. Sporogenous tissue undergo meiotic divisions to form _____
16. What is microsporogenesis ?
17. As the anthers mature and rehydrate, the microspores dissociate from each other and develop into pollen grains. T/F
18. Pollen grain measures about _____ mm in diameter.
19. Its wall is single layered. T/F
20. The hard outer layer called _____ is made up of _____
21. _____ is one of the most resistant organic material known.
22. No enzyme that degrades sporopollenin is so far known. T/F
23. Part of exine where sporopollenin is absent is -



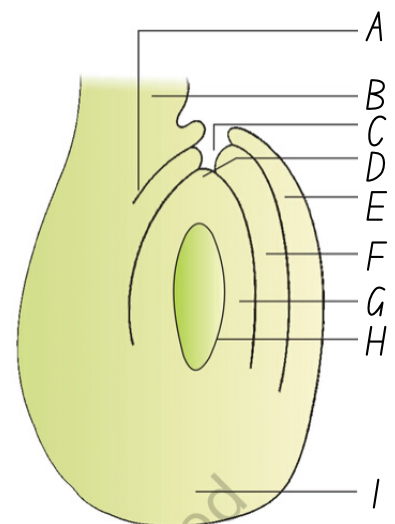
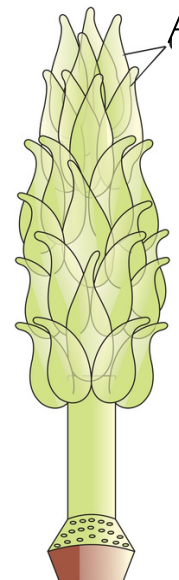
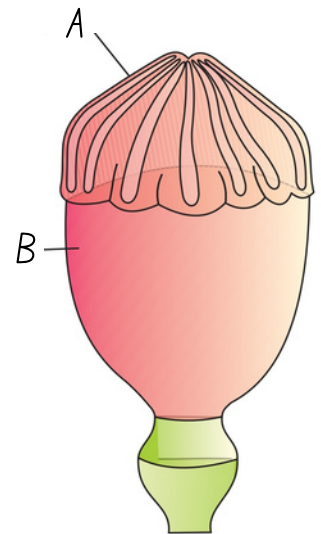
24. Intine is thin/thick layer made up of _____ and _____
25. Mature pollen grain contain 2 cells, namely -
26. Irregular shaped nucleus is present in vegetative/generative cell. T/F
27. Generative cell is _____ shaped.
28. _____ floats in the cytoplasm of _____
29. Generative cell have dense cytoplasm and nucleus. T/F
30. In less than ___% of angiosperms, pollen grains are shed at 3-celled stage.
31. _____ cell divide to give 3 celled stage.
32. Carrot grass also called _____, came into india as a contaminant with imported _____
33. Pollen consumption has been claimed to increase the performance of _____ and _____
34. In rice and wheat, pollen grains lose viability within ___ minutes.
35. Families whose pollen remain viable for months are - (3)
36. Liquid nitrogen temperature is - (NEET)
37. Pollen grains are preserved for years by using the technique of _____



• PISTIL, MEGASPORANGIUM (OVULE) & EMBRYO SAC

38. Monocarpellary condition means ?
39. Ovarian cavity is also called _____
40. Placenta is located outside the ovarian cavity. T/F
41. Megasporangia are commonly called _____
42. Megasporangia arise from placenta. T/F
43. Apocarpous ex (I) -
44. Syncarpous ex (I) -
45. Single ovule is present in (3) -
46. Multiple ovules are present in (3) -
47. Ovule is attached to placenta by _____
48. The body of the ovule fuses with funicle in the region called _____
49. Integuments encircle the nucellus except at _____
50. Opposite to micropyle is the _____ end.
51. Micropyle represents the basal part of the ovule. T/F
52. _____ is enclosed within the integuments.
53. Female gametophyte is also called _____
54. _____ have abundant reserve food materials.
55. An ovule generally has a single embryo sac. T/F
56. Ovules generally differentiate a single MMC from the chalazal/micropylar region of nucellus.

DigaQ. 4



57. MMC have thin/dense cytoplasm and inconspicuous/prominent nucleus.

58. What is monosporic development ? (NEET)

59. The nuclear divisions in the function megaspore are free nuclear. T/F

60. Egg apparatus consists of _____ and _____

61. Synergids have special cellular thickenings at the micropylar tip called _____

62. Fxn of filiform apparatus is -

63. A typical angiosperm embryo sac at maturity shows 7-nucleated, 8-celled condition. T/F

• POLLINATION

64. Pollen grains are non-motile. T/F

65. Depending on source of pollen, the 3 types of pollination are -

66. Ex of autogamy are - (3)

67. In chasmogamous flowers, anthers and stigma lie close to each other. T/F

68. _____ flowers produce assured seed-set even in the absence of pollinators.

69. What is Geitonogamy ?

70. Geitonogamy is functionally _____ and genetically similar to _____

71. Only type of pollination which brings genetically different types of pollen grains to the stigma is -

72. Two abiotic and one biotic agents for pollination are -

73. Majority of plants use abiotic/biotic agents for pollination.

74. Pollination by _____ is more common amongst abiotic pollinations.

75. Wind pollinators produce sticky pollen grains so that they stick to stigma. T/F

76. Feathery stigma and well exposed stamens are feature of -

77. Wind pollinators have _____ no. of ovules in the ovary. (NEET)

78. Packed inflorescence is a feature of wind pollinators. T/F (NEET)

79. Ex of wind pollination - (2)

80. Pollination by water is limited to _____ no. of genera, mostly monocot/dicot.

81. Ex. of fresh water pollinated plants - (2)

82. Ex. of marine water pollinated plants - (1)

83. Sea-grass ex -

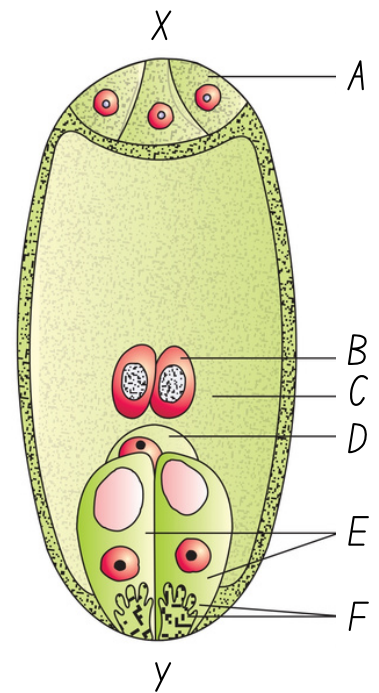
84. Aquatic plants not pollinated by water are - (2) (NEET)

85. In _____, epihydrophily is present. (NEET)

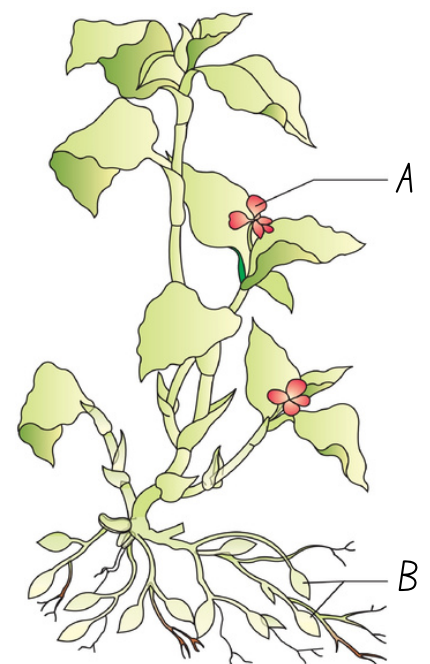
86. Hypohydrophily is present in -

87. Long, ribbon like pollen grains are present in -

DigaQ. 5

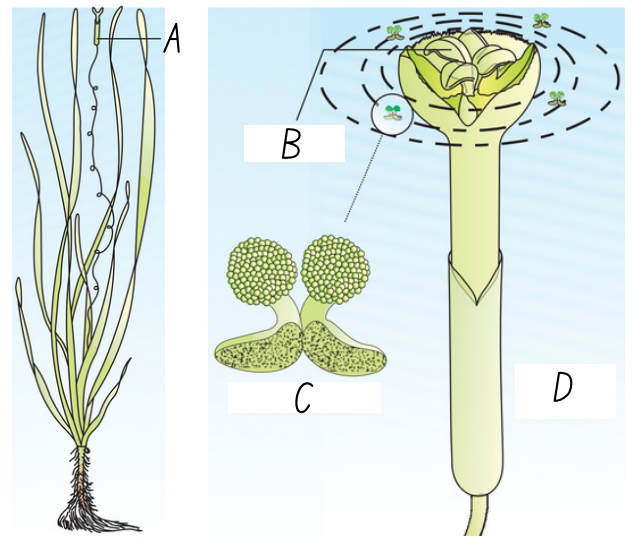


DigaQ. 6



88. In most of the water-pollinated species, pollen grains are protected from wetting by _____
89. Common biotic pollinating agents are - (10)
90. _____ are the dominant biotic pollinating agents.
91. Ex. of lizards reported as pollinating agents is - (2)
92. Tallest flower is of _____ feet and its name is -
93. Largest inflorescence -
94. Largest flower -
95. In *Amorphophallus*, floral reward given by plant is -
96. *Yucca* and _____ cannot complete their life cycle with each other.
97. Moth deposit its egg in _____ of the ovary.
98. Continued self-pollination result in _____
99. 4 outbreeding devices are -
100. *Papaya* is monoecious/dioecious. (NEET)
101. Monoecious ex - (2)
102. In 2-celled pollen, the generative cell divide during _____
103. _____ guides the entry of pollen tube.
104. To study pollen germination, _____% solution of _____ is taken.
105. After waiting for ____-____ min, pollen grains are studied under high/low power microscope.
106. What is emasculation ?
107. Emasculated flowers are covered with a bag made up of _____. This process is called -
108. There is no need for emasculation in _____ flowers.

DigaQ. 7

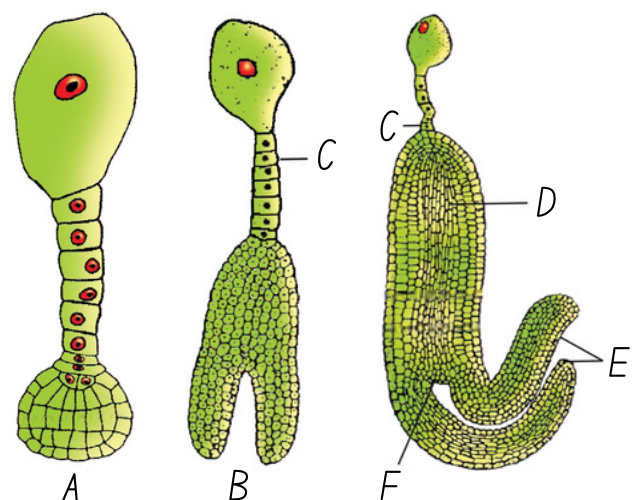


DigaQ. 8



• DOUBLE FERTILLISATION

109. _____ is a event unique to angiosperms. (NEET)
110. Suspensor grow to push embryo away from _____ end.
111. Suspensor help to transfer _____ to embryo.



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• POST-FERTILLISATION : STRUCTURES AND EVENTS

• ENDOSPERM

112. Embryo development precedes endosperm development. T/F

113. Free-nuclear endosperm ex - (1) (NEET)

114. Endosperm is completely consumed in (3) -

115. Endosperm persist in mature seeds in (2) -

116. Endosperm persist in cereals. T/F

• EMBRYO

117. The zygote give rise to _____ and subsequently _____

118. Name the 2 parts of embryo -

119. Embryonal axis above the level of attachment of cotyledon is _____ and below is _____

120. Radicle is covered by -

121. In _____ family, cotyledon is called scutellum.

122. In monocot, root cap is enclosed in _____

123. Coleorhiza is an undifferentiated sheath cell. T/F

124. Epicotyl is enclosed in a _____ structure, the _____

• SEED

125. Fertilised ovules means -

126. Non-Albuminous seed doesn't have _____ (NEET)

127. Residual, persistent nucellus is called _____ (NEET)

128. Non-albuminous seed ex (2) - (NEET)

129. Albuminous seeds ex (4) -

130. Perispermic seeds ex (2) - (NEET)

131. Ex-albuminous means seed which contains albumin. T/F

132. As the seeds mature, seeds lose ____ % of moisture my mass.

133. Integuments develop into _____

134. _____ facilitates the entry of water and oxygen for germination.

135. Mustard fruit is fleshy/dry.

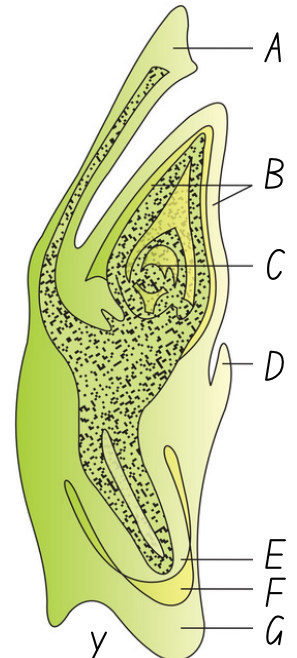
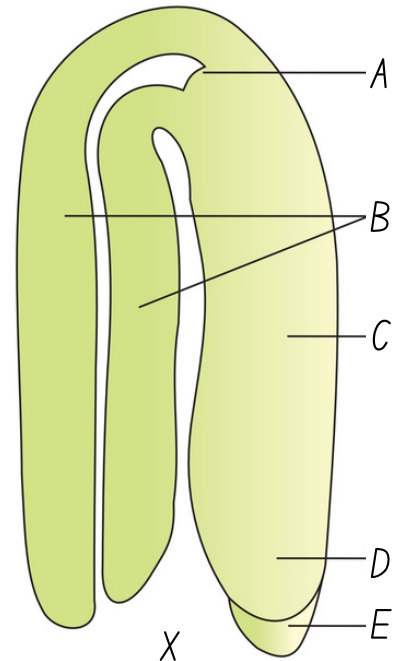
136. 3 examples of fruits which developed from thalamus are -

137. Parthenocarpic fruit ex - (1) (NEET)

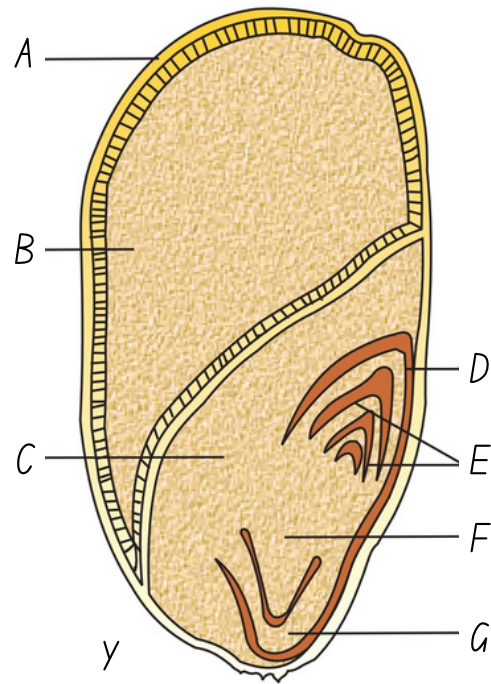
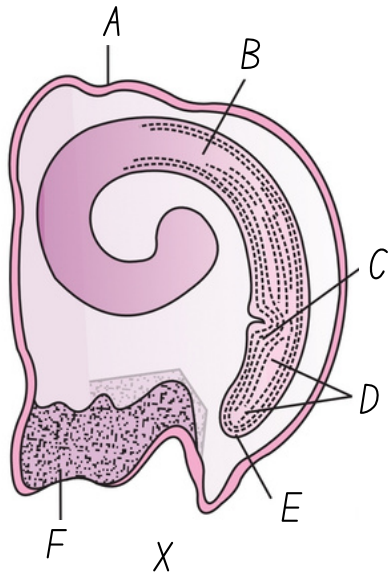
138. Seeds of large no.of species lose viability in few months. T/F

139. The oldest viable seed is of _____ excavated from _____

DigaQ. 9



DigaQ. 10



140. The seed of lupine germinated after _____ years of dormancy.

141. Seed of a date palm, namely _____, had a viability of _____ years and was discovered at _____ near _____

142. Plant with large no. of tiny seeds ex. are - (4)



• APOMIXIS & POLYEMBRYONY

143. Apomixis is present in (2) -

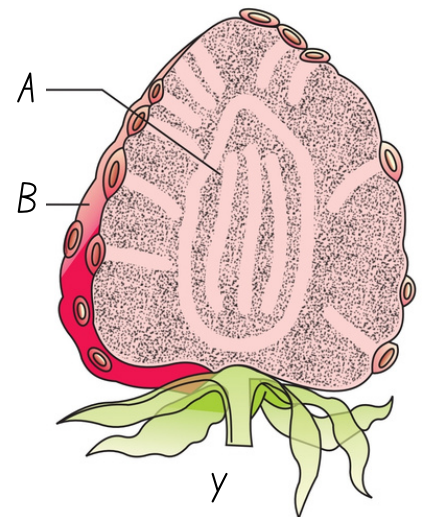
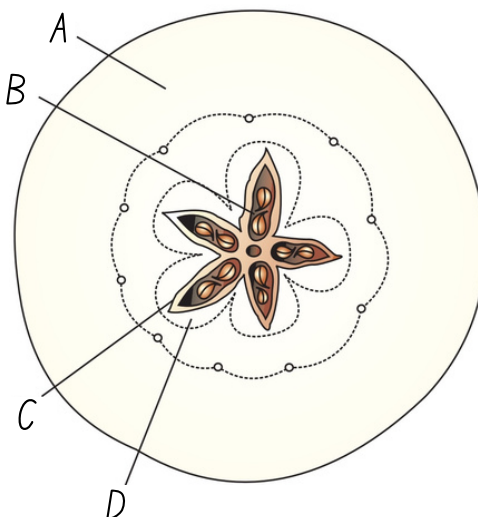
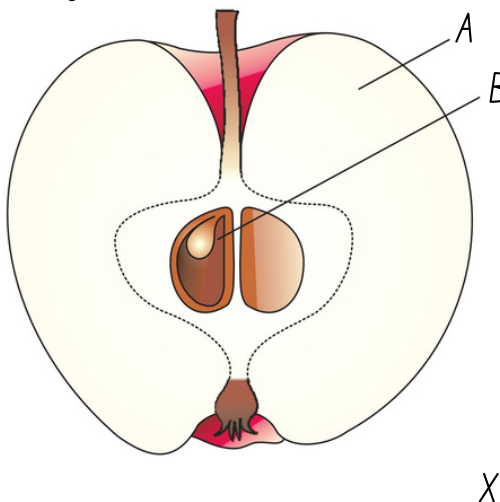
144. _____ is a form of asexual reproduction that mimic sexual reproduction.

145. Polyembryony ex (2) - (NEET)

146. Why seeds of orchids symbiotically associate with mycorrhiza ?

147. Why coconuts are found near sea beaches ?

DigaQ. 11



REPRODUCTION IN FLOWERING PLANTS



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ANSWERS

• PRE-FERTILLISATION

1. Flowers

2. Filament and anther

3. Proximal, thalamus of petal

4. Bilobed, ditheous

5. 4

6. Pollen sacs

7. Epidermis, endothecium, middle layer and tapetum

8. Tapetum

9. Protection and help in dehiscence of anther

10. Dense, more than one

11. Sporogenous tissue

12. Connective

13. Endothecium

14. T

15. Microspore tetrad

16. The process of formation of microspores from a pollen mother cell

17. F, dehydrate

18. 0.025-0.050

19. F

20. Exine, sporopollenin

21. Sporopollenin

22. T

23. Germ pores

24. Thin, cellulose and pectin

25. Vegetative cell and generative cell

26. Vegetative cell

27. Spindle

28. Generative cell, vegetative

29. T

30. 40

31. Generative

32. Parthenium, wheat

33. Athletes and race horses

34. 30

35. Rosaceae, Leguminosae and Solanaceae

36. -196°C

37. Cryopreservation

38. Single pistil

39. Locule

40. F

41. Ovules

42. T

43. Michelia

44. Papaver

45. Wheat, paddy and mango

46. Papaya, watermelon and orchids

47. Funicle

48. Hilum

49. Micropyle

50. Chalazal

51. F

52. Nucellus

53. Embryo sac

54. Nucellus

55. T

56. Micropylar

57. Dense, prominent

58. Embryo sac form from single megaspore rest all degenerate

59. T

60. 2 synergids and 1 egg cell

61. Filiform apparatus

62. Guide the pollen tube into the synergids

63. F

64. T

65. Autogamy, geitonogamy, xenogamy

66. Viola, Oxalis and Commelina

67. F



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68. Cleistogamous (Autogamous)
69. Transfer of pollen grains from the anther to the stigma of another flower of the same plant
70. Cross pollination, autogamy
71. Xenogamy
72. Abiotic - water and wind, biotic - animals
73. Biotic
74. Wind
75. F, they produce non-sticky pollen grain
76. Wind pollinators
77. I
78. T
79. Grasses and maize (corn)
80. 30, monocot
81. Vallisneria and Hydrilla
82. Seagrasses
83. Zostera
84. Water hyacinth and water lily
85. Vallisneria
86. Zostera
87. Sea grasses
88. Mucilaginous covering
89. Bees, butterflies, flies, beetles, wasp, moths, ants, sunbirds, hummingbirds, bats
90. Bees
91. Gecko lizard and garden lizard
92. 6 feet, amorphophallus
93. Amorphophallus
94. Rafflesia
95. Safe place to lay eggs
96. Moth (name Pronuba)
97. Locule
98. Inbreeding depression

99. I. Unisexuality of flower, II. Dichogamy : Different maturation time of androecium and gynoecium, III. Self-incompatibility : Inhibition of pollen germination of same plant, IV : Anther and stigma are at different position so that pollen cannot come in contact

100. Dioecious

101. Castor and maize

102. Growth of pollen tube in the stigma

103. Filiform apparatus

104. 10, sugar

105. 15-30, low

106. Removal of anther from floral bud before anther dehiscence

107. Butter paper, bagging

108. Unisexual female

• DOUBLE FERTILLISATION

109. Double fertilisation

110. Micropylar

111. Nutrients

• POST-FERTILLISATION

112. F

113. Coconut water

114. Pea, groundnut, beans

115. Castor and coconut

116. T

117. proembryo, globular, heart-shaped and mature embryo

118. Embryonal axis and cotyledons

119. Epicotyl, hypocotyl

120. Root cap

121. Grass



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122. Coleorhiza
123. T
124. Hollow foliar, coleoptile
125. Seed
126. Endosperm
127. Perisperm
128. Pea, groundnut
129. Wheat, maize, barley, castor
130. Black pepper and beet
131. F
132. 10-15
133. Seed coat
134. Micropyle
135. Dry
136. Apple, strawberry and cashew
137. Banana
138. F, majority live for several years
139. *Lupinus arcticus*, arctic tundra
140. 10,000
141. *Phoenix dactylifera*, 2000, King Herod's palace, Dead sea
142. Orchids, *orobanche*, *striga*, *figus*

• APOMIXIS & POLYEMBRYONY

143. Asteraceae and grasses
144. Apomixis
145. Citrus and mango
146. Seeds of orchids are very small and have no food reserves. This is why they have to bond symbiotically with fungi to form mycorrhiza for germination.
147. Coconuts are best to get dispersed through sea water. Reason - 1. Coconut have mesocarp made of husk which help to float. 2. Coconut have large food reserve material which help for survival for long time.

• DigaQs

DigaQ. 1 - three-dimensional cut section of an anther

- | | |
|-------------------|------------------------|
| A - Pollen grains | C - Line of dehiscence |
| B - Pollen sacs | D - Filament |

DigaQ. 2 - Transverse section of a young anther

- | | |
|------------------------|-------------------|
| X | Y |
| A - Connective | A - Epidermis |
| B - Epidermis | B - Endothecium |
| C - Endothecium | C - Middle layers |
| D - Sporogenous tissue | D - Microspore |
| E - Tapetum | mother cells |
| F - Middle layers | E - Tapetum |

DigaQ. 3 - stages of a microspore maturing into a pollen grain

- | |
|------------------------|
| A - Asymmetric spindle |
| B - Vegetative cell |
| C - Generative cell |

DigaQ. 4

W - A dissected flower of *Hibiscus* showing pistil

- | |
|--------------|
| A - Stigma |
| B - Style |
| C - Ovary |
| D - Thalamus |
- X - Multicarpellary, syncarpous pistil of *Papaver*
- | |
|----------------------|
| A - Stigma |
| B - syncarpous ovary |
- Y - A multicarpellary gynoecium of *Michelia*
- | |
|-------------|
| A - Carpels |
|-------------|



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Z - A diagrammatic view of an anatropous ovule

A - Hilum

B - Funicle

C - Micropyle

D - Micropylar pole

E - Outer integument

F - Inner integument

G - Nucellus

H - Embryo sac

I - Chalazal pole

DigaQ. 5 - Mature embryo sac

X - Chalazal end

Y - Micropylar end

A - Antipodals

B - Polar nuclei

C - Central cell

D - Egg

E - Synergids

F - Filiform apparatus

DigaQ. 6

A - Chasmogamous flower

B - Cleistogamous flower

DigaQ. 7 - Pollination by water in Vallisneria

A - Female flower

B - Stigma

C - Male flower

D - Female flower

DigaQ. 8 - Stages in embryo development in a dicot

A - Globular embryo

B - Heart shaped embryo

C - Suspensor

D - Radicle

E - Cotyledon

F - Plumule

DigaQ. 9

X - A typical dicot embryo

A - Plumule

B - Cotyledons

C - Hypocotyl

D - Radicle

E - Root cap

Y - L.S. of an embryo of grass

A - Scutellum

B - Coleoptile

C - Shoot apex

D - Epiblast

E - Radicle

F - Root cap

G - Coleorhiza

DigaQ. 10 - Structure of some seeds

X

Y

A - Seed coat

A - Pericarp

B - Cotyledon

B - Endocarp

C - Shoot apical
meristem

C - Scutellum

D - Coleoptile

D - Hypocotyl root axis

E - Plumule

E - Root tip

F - Radicle

F - Endosperm

G - Coleorhiza

DigaQ. 11 - False fruits

X - apple

A - Thalamus

B - Seed

C - Endocarp

D - Mesocarp

Y - strawberry

A - Thalamus

B - Achene



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SCAN AND DONATE US SO THAT WE
CAN CREATE MORE SUCH QUALITY
CONTENT FOR YOU!

JUST ₹10-20 WILL BE APPRECIABLE! :)

FRIEND: TERE BIO MAI 360/360
"BIOHACK" KI VAJH SE AAYE NAA..



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